AMENDMENTS TO THE SPECIFICATION:

Please replace paragraphs **[0034]** through **[0036]** with the following amended paragraphs of the same number.

[0034] State-of-the-art tubing cutters have been provided with a steel compression spring bias against the shaped charge assembly. However, such arrangements represent substantial safety compromises when bearing upon a steel or ferrous metal thrust disc 44 and/or end plate 45 or 46 due to the difficulty in maintaining the cutter housing interior free of loose particles of explosive. Loose explosive particles can be ignited by impact or friction in handling, bumping or dropping the assembly. Ignition that is capable of propagating an explosion may occur at contact points between a steel~~, shaped charge end plate~~ thrust disc 44 or ferrous metal end plates 45 or 46 and a steel housing 20. To minimize such ignition opportunities, the thrust disc 44 and end plates 45 and/or ~~plate~~ 46, for the present invention, are preferably fabricated of non-sparking brass. Assuming the thrust disc 44 is brass, the positioning pins 19 may consequently be formed from steel or other ferrous material. If the compression washer 47 is an elastomeric or other non-ferrous material, the end plate 46 may be a ferrous material. Conversely, if the resilient bias on the assembly is provided by a ferrous spring such as a bellville washer type not shown, the end plate 46 material should be non-ferrous.

[0035] As a further alignment control means, the outside perimeter diameter of the brass thrust disc ~~plate~~ 44 may be only slightly less than the inside diameter of the housing 20 to assure centralized alignment of the explosive assembly within the housing 20. The end plates 45 and/or ~~plate~~ 46, on the other hand, which may be formed of a ferrous material, should have an outside perimeter diameter less than the inside diameter of the steel housing to avoid a steel-to-steel contact.

[0036] The shaped explosive charge 56 that is characteristic of shaped charge tubing cutters comprises ~~is~~ a precisely measured quantity of powdered form explosive material such as RDX or HMX that is formed into a truncated cone against the ~~conical face of~~ conical faces respective to a pair of end plates 45 ~~a thrust plate 44~~

explosive material 56 is provided to accommodate a detonation booster 57. The taper face explosive cones of the present invention are clad with a high density, pressed, powdered metal liner 58 comprising about 80+% tungsten and an approximate 80/20% mixture of copper and lead powders. A representative liner thickness may about 0.050". As understood by those skilled in the art, shaped charge penetration capability increases with (a) an increase in liner density and (b) a pressed powder liner material. A pair of such conical units are assembled in peak-to-peak opposition along a common apex truncation plane P_J.

Please replace paragraphs [0050] and [0051] with the following amended paragraphs.

[0050] A simplified and less expensive alternative to the foregoing test procedure is represented by **FIGs 10** and **11** which utilizes the same coupons 82 secured (as by welding, for example) to a base plate 84 as radial elements about a circle. The SC, independent of a housing 20 enclosure, is positioned within the interior circle at a substantially concentric stand-off (dimension S.O.) from the interior edge of the coupons 82 and discharged. A zero (0) stand-off dimension S.O. may correspond to the distance between the ~~SC~~ outside perimeter of the SC thrust <u>disc</u> ~~plate~~ 44 and the housing 20 inside perimeter.

[0051] The graph of **FIG. 12** illustrates an actual application of the two procedures described above. The tubing 80 object of the test was an L-80 alloy having a mid-range strength and standard wall thickness as specified by the API for perforator testing. Radial penetration dimension is represented linearly along the ordinate axis. Environmental pressure on the test shot is represented in units of 1000lbs/in^2 (ksi) along the abscissa. The solid line "T" represents the tube wall thickness dimension of 0.190". The test included two basic sets of environmental conditions: a) at ambient temperature and pressure and b) at the rated downhole temperature and pressure. The shot point designated on the graph as QC_1 results from a **FIG. 10** test apparatus. The graph point QC_1 reports the average coupon penetration by the 1-11/16" shaped charge test subject without the housing 20 and with no (zero) clearance between the

SC perimeter and the coupon 82 edge. The shot point designated as QC_2 also results from a **FIG. 10** test method and reports the average coupon penetration by a 1-11/16" shaped charge test subject in assembly with a stand-off dimension S.O. corresponding to the average radial ~~nominal~~ distance between the perimeter of the SC thrust disc ~~plate~~ 44 perimeter and the inside wall of a tubing ~~bubing~~ 80. The shot points designated as IT_1 and IT_2 on the **FIG. 12** graph report the SC penetration of coupons 82 set in the manner illustrated by **FIGs 8** and **9**. Shot point IT_1 was made under atmospheric P/T conditions whereas shot IT_2 was made under 15 kps pressure.